THE HISTORY OF THE

AEROSPACE DEFENSE COMMAND

Fiscal Year 1972

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this period, the system achieved valid data at ranges up to 300 miles, including the intercept of two Soviet Bear bombers at a range over 200 miles from the EC-121. The data link held promise of a significant extension of intercept control against long-range aircraft.[58]

b(1) 1972 marked a milestone in the command's missile surveillance with most of the Defense Support Program (DSP) ready and working. This relatively new concept for space-based infrared surveillance, dispersed in widely separated locations, transitioned (in part) from a research and development system into an operational entity. The system consisted of surveillance satellites placed in equatorial geo-synchronous orbits, ground readout stations, and data processing facilities.

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58. Ltr, ADC (LGX) to HO, subj: Nomination for Zuckert Management Award, w/1 atch, 20 Jun 72; ltr, ADC (DOTE) to DOTW, subj: Nomination for Zuckert Management Award, 3 May 72, w/1 atch.

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Addition of the DSP promised a greatly expanded tactical warning capability, allowing ballistic missile launch observation early in the flight. Command felt that the increased reaction time available (from warning to impact) permitted substantial savings of both strategic offensive and defensive alert forces.[59]

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59. HQ ADC, Memo (DOFS), subj: Defense Support Program (DSP), June 1972; memo (DCS/Plans), subj: DSP, n.d. (ca June 1972).

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When it came to supporting attack assessment and battle control information, the systems fell short because they were not designed to survive. Thus, they provided little more than general assessment of the nature of an attack on the U. S. Finally, for the so-called peacetime functions (strategic warning, scientific and technical intelligence, and arms control agreement verification) the available systems proved limited also. The effort designed to correct these inadequacies appeared as a USAF Master Plan for Space Surveillance, a two-volume work dated January 1972. Whether they would ever move from concept to reality remained an open question dependent upon many factors, not the least of which was future budgets.[60]

60. USAF Master Plan for Space Surveillance Vol I, Summary and Vol II, The Detailed Plan, Jan 1972. Both documents contain SAR material but the information cited is Secret only Also see: Briefing, prepared HQ ADC (XPC), Sep 72; ltr,

number of analysts believed that the pause was probably linked to the prospect that the Soviets and the U.S. were near agreement at the Strategic Arms Limitation Talks (SALT) on a pact to freeze rival land-based missile forces.[17]

Vertical-Launch Test Program. In addition to the large-size silos under construction, there was still another area of concern during Fiscal Year 1972. That was the most recent vertical-launch program being pursued by the Soviets. Three such programs had been conducted since 1961. Two were assessed as purely scientific, but the third appeared to have a definite military orientation. The first launch of the latter program occurred at the Kapustin Yar missile test center in December 1969. Three launches were made in 1970, four in 1971, and nine during the first half of 1972. Most of the payload vehicles had been detected and tracked by the Diyarbakir sensors. Detections were also made by ADC's 440L Over-the-Horizon (OTH) Forward-scatter radar system and Defense Support Program, the U.S. Army's Le Firm Armor system, and telemetry intercepts by cooperating agencies. Though the purpose of the program remained a puzzle, by March 1972

17. Michael Getler, "Laird Expects Soviets to Test New Missiles," Washington Post, 28 Mar 72, p 8; William Beecher, "Laird Predicts Soviets Will Start Tests on New ICBMs Soon," New York Times, 28 Mar 72, p 28; Fred Farrar, "Laird Expects Russ ICBM Tests Soon," Chicago Tribune, 28 Mar 72, p 5.

intelligence sources speculated that the Soviets were developing a new guidance and control system capable of adjusting the payload impact point. Analyses of intercepted telemetry data from the KY-9 (the designation assigned the program by U.S. intelligence sources) payload indicated that it consisted of a propulsion engine, fuel tanks, a telemetry package, probably an on-board computer, and a sensor to provide payload guidance. At the close of Fiscal Year 1972, however, the maximum impact point adjustment achieved had been 17 to 20 nautical miles in any direction.[18]

Such a guidance and control system was needed if the Soviets intended to add a MIRV capability to their ICBMs. Because the MIRV offered more accuracy than the Multiple Reentry Vehicle (MRV) already tested on the SS-9 and SS-11, it was logical to assume that Soviet research and development teams were working toward that end. Admiral Moorer, during an appearance before the Senate Committee on Armed Services on 16 February 1972, said that it was not clear whether the Soviets had actually tested a MIRV but that it was unquestionable that they had

18. HQ ADC, Dir/Intel, Daily Intelligence Summary, 17 Dec 71, 20 Dec 71, 27 Dec 71, 10 Jan 72, 4 Mar 72, 13 Mar 72, 10 Apr 72, 26 Apr 72, 15 May 72, 5 Jun 72, and 13 Jun 72. Data for Daily Intelligence Summaries were obtained from various intelligence sources, including DIA and NORAD.

achieved success toward the development of MIRVs for their missiles.[19] The KY-9 vertical launches appeared to be a step in that direction.

Soviet ICBM Launches
1969 to 1972

Type	1969	1970	1971	1972
SS-7	26	19	20	22
SS-8	3	1	1	1
SS-9	17	27	6	4
SS-11	28	40	29	7
SS-13	6	16	4	3
Totals	80	103	60	37

SOURCE: Figures provided by HQ ADC, Dir/Intel, from NORAD Weekly Intelligence Reports

The Growing SLBM Threat. Any deceleration that might have occurred in the land-based ICBM deployment during 1970-1971 was more than offset by the increase in the Soviet Sea-Launched Ballistic Missile (SLBM) capability. Also, the threat posed by the SLBMs had three aspects that set it apart from the ICBM threat. First, the uncertainty was not the projected competency of the boats and their missiles, but rather their location and concentration off the U.S. coastlines. Second, few of the U.S. strategic forces were outside the range of the SLBMs. Where bomber force survivability had been measured in 15-minute warning periods for dispersal following the launch of an ICBM attack,

19. "Moorer Warns of Soviet Military Might, Calls for More U.S. R&D," Aviation Daily, 17 Feb 72.

While these systems were being developed, constructed, tested, and placed in operation, the Soviets increased their missile deployment, missile technology, and launch procedures. Therefore, a more sophisticated detection system was needed to give even more warning time. By 1968 HQ ADC developed plans for a satellite-borne sensor and a ground control station system that would detect and report launches as the missile left the launch pad. It was also to report on nuclear detonations.

b(1)

the second and third satellites were used in the satellite-borne surveillance system--the Defense Support Program (DSP). These were monitored by ground control stations in the eastern and western hemispheres.[40]

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But the threat from sea-launched ballistic missiles developed as rapidly as that of the ICBM. To counter a surprise attack from that quarter, AVCO Corporation was given a contract on 13 December 1965 to design an SLBM detection and warning

40. Study, HQ ADC, Space Surveillance/Sentinel Interface Study, Mar 68, pp 18-21; Intvw, author with Maj. T.E. Hodgson, HQ ADC DCS/Plans, Dir/Missile and Space Defense, 22 Sep 72.

440L Turnover and Transition to ADC. Aerospace Defense Command assumed responsibility for the correlation center and receiver sites in Europe on 1 June 1971 and the Data Analysis Center at McGuire AFB, New Jersey, on 1 July 1971, but the transmitter sites still had not been accepted at the end of June 1972. Final operational capability status--the date that the final electronics configuration would be installed at Chitose and new power amplifiers would be installed and tested at Awase--was projected as 1 July 1973.[109]

The Defense Support Program. The increased missile capability demonstrated by the Soviet Union during the 1960s made improvements in tactical warning a necessity for U.S. missile warning. BMEWS provided the initial detection capability and that had been improved considerably with the 440L OTH radar system; but with FOBS, depressed-trajectory ICBMs, and longer range SLBMs added to the Soviet inventory, still more warning time was needed. The Defense Support Program, Program 647, was developed and deployed for that purpose.

This was not a new method of missile detection. The system evolved from research and development

109. Msg, ADC to CSAF, CV 151520Z Jun 71 (Doc 626 in Hist of ADC, FY 1971); msg, CSAF to AFSC and ADC, RDP 171651Z Aug 71 (Doc 87); msg, ADC to CSAF, XP 231400Z Aug 71 (Doc 88).

efforts of the Missile Defense Alarm System (MIDAS) and Program 461 in the early 1960s. The MIDAS testing of satellite-borne infrared sensors for detection purposes began on 26 February 1960 with the first test ending in failure. On 5 May 1960, the second MIDAS satellite produced the first successful, though limited, infrared detection data. In May 1963, Program 461 Engineering Test Series III, a continuation of the MIDAS-type tests, exceeded design specifications by detecting all cooperative launches in its field of view. The Engineering Test Series led to the Program 461 Research Test Series; the Research Test Series II Study program led to the establishment of Program 266; and, Program 266 became Program 949. On 14 June 1969, for security reasons, Program 949 was redesignated Program 647 with an unclassified title, Defense Support Program (DSP).[110]

The requirement for a satellite-borne ballistic missile attack warning and surveillance system was spelled out in HQ USAF Specific Operational Requirement No. 209, dated 28 January 1964. In that document HQ USAF said that:[111]

> A limited operational capability is required as soon as practicable to detect ballistic missiles launched

110. AFSC, System Package Program for Program 647, 15 Feb 72, passim (on file in DCS/Ops, Dir/Space Ops).

111. Ibid., p 13-5

> from Soviet regions, for the purpose of investigating in detail and without incurring additional investment costs, the operational application of a satellite-borne missile defense alarm system.

The system mission, HQ USAF noted, would be detection and reporting of surface and aerospace launched ballistic missiles at the earliest point during the launch phase. To accomplish that mission, the system maintained a minimum of two operational satellites in orbit continuously. Observations would be transmitted to existing ground readout stations, and then relayed via the most expeditious communications routes to the CONAD COC and other using agencies. Aerospace Defense Command was designated the operating command on 21 September 1967 and operational control was vested in CINCONAD by the Joint Chiefs of Staff on 18 April 1968.[112]

The Defense Support Program developed along the lines set down by HQ USAF. A readout station was established at Woomera, Australia, to receive data from a satellite to be placed in synchronous equatorial orbit in the eastern hemisphere,

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Construction of the overseas ground station was begun by Australia in January 1970. The

112. Ibid., pp 13-5, 13-7.

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While the ground stations were under construction, work also progressed toward getting a satellite ready for launch. The first effort b(1) ended in a partial failure. During the launch, the upper stage of the TITAN IIIC booster malfunctioned and the satellite went into a highly elliptical orbit (apogee: 19,378 nautical miles, perigee: 14,038 nautical miles). Though the spaceborne system was not in synchronous orbit there were some spin-off returns. Data from both overseas and continental United States areas were viewed for developmental purposes. Because the satellite furnished data from both areas, it was called "the best mistake that ever happened" by those in HQ ADC who worked on the project.[114]

The second satellite, b(1) went into synchronous orbit 19,378 nautical miles above the earth in the eastern hemisphere. The third satellite b(1) was placed into synchronous

113. Ltr, HQ 14 AEROSPFORCE (ACM) to HQ ADC (ACM), subj: FY 71 Command Status Review, 19 Jul 71 (Doc 618 in Hist of ADC, FY 1971).

114. Intvw, author with Capt Winston H. King, ADC DCS/Ops, Dir/Space Ops, 20 Oct 72. AFSC, System Package Program for Program 647, 15 Feb 72, p 1-4 (filed in DCS/Ops, Dir/Space Ops.

orbit over the western hemisphere at an altitude of 19,300 nautical miles. A fourth satellite, b(1)

115

The overseas ground station began receiving test data from the first synchronous orbit satellite and b(1) that portion of the Defense Support Program had demonstrated an "emergency operational capability." While the system was still in a test configuration, it could receive detection data and provide information to CINCONAD by telephone or teletype. "Emergency" operational capability was officially conferred on the overseas segment b(1) and it continued in that configuration until achieving "interim" capability status b(1) HQ ADC accepted the DSP overseas station and ground communications network, exclusive of user terminals, b(1) however, the official turnover date b(1) at which time that part of the system moved from "interim" capability to initial operational capability.[116]

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115. AFSC, System Package Program for Program 647, 15 Feb 72, p 1-4; msg, SAMSO to ADC, SZG 091630Z Feb 72 (Doc 89); ntvw, author with Lt Col R.A. Miller and Capt W.H. King, ADC DCS/Ops, Dir/Space Ops, 20 Oct 72.

116. Msg, SMAMA to AFLC, CC 090130Z Feb 72 (Doc 90); msg, ADC to SAMSO, XPDS 101730Z Mar 72 (Doc 91); msg, ADC to CSAF, et al., XPDS 262105Z May 72 (Doc 92); intvw, author with Lt Col R.A. Miller, ADC DCS/Ops, Dir/Space Ops, 24 Oct 72.

The ground station in the continental United States underwent preliminary design review in early October 1971, critical design review in January 1972, and "emergency" operational capability testing during b(1) Initial operational capability had been scheduled for b(1) however, like the eastern hemisphere portion of the system, the station could have been used if needed even though it it still carried test status. Category II testing was scheduled to begin in mid-August 1972.[117]

Besides the two ground stations, a multipurpose facility at Lowry AFB, Denver, Colorado, was turned over to HQ ADC b(1) With acceptance command gained a training facility and a systems analysis, data processing, and computer program development capability.[118]

Thus, at the close of Fiscal Year 1972, with one ground station and a multipurpose facility in an initial operational capability status and the second ground station fast approaching Category II test status, HQ ADC almost had an operational satellite early warning system.

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117. Msg, ADC to SAMSO, XPDS 291830Z Feb 72 (Doc 93); msg, ADC to Det 2, SAMSO, DO 152300Z May 72 (Doc 94); intvw, author with Lt Col R.A. Miller, ADC DCS/Ops, Dir/Space Ops, 24 Oct 72.

118. Msg, SAMSO to USAF, et al., SZD 171800Z Apr 72 (Doc 95); intvw, author with Capt C.C. Collins, ADC DCS/Ops, Dir/Space Ops, 24 Oct 72.

EXTRACT FOLLOWS

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AEROSPACE DEFENSE COMMAND

Fiscal Year 1972

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continental United States ground station started in October 1970.[113]

While the ground stations were under construction, work also progressed toward getting a satellite ready for launch. The first effort came on 6 November 1970 but ended in a partial failure. During the launch, the upper stage of the TITAN IIIC booster malfunctioned and the satellite went into a highly elliptical orbit (apogee: 19,378 nautical miles, perigee: 14,038 nautical miles). Though the spaceborne system was not in synchronous orbit there were some spin-off returns. Data from both overseas and continental United States areas were viewed for developmental purposes. Because the satellite furnished data from both areas, it was called "the best mistake that ever happened" by those in HQ ADC who worked on the project.[114]

The second satellite, launched on 5 May 1971--one day behind schedule--went into synchronous orbit 19,378 nautical miles above the earth in the eastern hemisphere. The third satellite orbited on 1 March 1972, also a day later than scheduled. It was placed into synchronous

113. Ltr, HQ 14 AEROSPFORCE (ACM) to HQ ADC (ACM), subj: FY 71 Command Status Review, 19 Jul 71 (Doc 618 in Hist of ADC, FY 1971).

114. Intvw, author with Capt Winston H. King, ADC DCS/Ops, Dir/Space Ops, 20 Oct 72. AFSC, System Package Program for Program 647, 15 Feb 72, p 1-4 (filed in DCS/Ops, Dir/Space Ops.

orbit over the western hemisphere at an altitude of 19,300 nautical miles. A fourth satellite, "b(1)" "b(1)" was scheduled for launch in May 1973.[115]

The overseas ground station began receiving test data from the first synchronous orbit satellite and by July 1971 that portion of the Defense Support Program had demonstrated an "emergency operational capability." While the system was still in a test configuration, it could receive detection data and provide information to CINCONAD by telephone or teletype. "Emergency" operational capability was officially conferred on the overseas segment in November 1971 and it continued in that configuration until achieving "interim" capability status on 15 November 1971. HQ ADC accepted the DSP overseas station and ground communications network, exclusive of user terminals, on 25 May 1972; however, the official turnover date was 1 June 1972, at which time that part of the system moved from "interim" capability to initial operational capability.[116]

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115. AFSC, System Package Program for Program 647, 15 Feb 72, p 1-4; msg, SAMSO to ADC, SZG 091630Z Feb 72 (Doc 89); ntvw, author with Lt Col R.A. Miller and Capt W.H. King, ADC DCS/Ops, Dir/Space Ops, 20 Oct 72.

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The ground station in the continental United States underwent preliminary design review in early October 1971, critical design review in January 1972, and "emergency" operational capability testing during 16 May-15 June 1972. Initial operational capability had been scheduled for June 1972 but this goal was not met; however, like the eastern hemisphere portion of the system, the station could have been used if needed even though it it still carried test status. Category II testing was scheduled to begin in mid-August 1972.[117]

Besides the two ground stations, a multipurpose facility at Lowry AFB, Denver, Colorado, was turned over to HQ ADC on 13 April 1972. With acceptance command gained a training facility and a systems analysis, data processing, and computer program development capability.[118]

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